Dave Sacco wanted some notes on Monkman Barr

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MONKMAN PASS COAL PROPERTY
Summary Notes
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Location

The property is located in northeast BC about 40 kilometres south of the Quintette coal mine.

History/Ownership

The property has been explored since 1970; initially by McIntyre then PetroCan. PetroCan submitted a Stage II report in 1983 proposing a 3+ million tonne/year surface operation. Interest in coal was already declining and Petrocan closed its coal department in about 1985 and later sold its interests in the property to Smokey River who now control the property. Other partners include Mobil. No exploration work has been performed on the property in the last 10 years.

Geology

The coal occurs in the same formation as at Quintette and Bullmoose (Gates Formation). The section contains 12 seams (seven mineable) with a cumulative thickness of about 25 metres. Seams are numbered 1 at the bottom to 12 at the top. Seams B1, B3 and B4 make up most of the reserves (90%). The lowest ratio coal is in the Duke Mountain pit which is south of Kinuseo Creek on a north facing slope

Access

The Duke Mountain pit could be accessed by a 8 kilometre spur off the existing all weather Tumbler Ridge - Dawson Creek road. It is 40 kilometres from this point to the Quintette wash plant. The pit location is away from any major drainages and does not appear to have any environmental problems.

Reserves/resources/mining

Three open pit areas have been studied. These are Honeymoon east and west and Duke Mountain. The geological resource in the Duke Mountain Honeymoon pit areas is 513 million tonnes. ROM reserves are calculated considering coal loss (30cm) dilution (5%) mining thickness (1 metre) individual pit reserves are:

pit	ROM reserves	ROM strip ratio	CC strip ratio	CC reserves
Duke	38	5.4/1	7.7/1	27
Honeymoon east	69	6.3/1	9/1	48
Honeymoon west	21	6.9/1	9.9/1	15

Clean coal (CC) ratio and tonnage calculated assuming a 70% as received plant recovery.
No study has been done to see what tonnage is available at lower strip ratios because the original plans called for a 3+ million tonne/year operation.

Coal Quality

The coal is a medium volatile coking coal (Romax 1.3%). It appears to be similar in quality to coal from Bullmoose though the rank is a little higher which is a plus. Insitu ash from the Duke Mountain pit is about 23%. Drill core yields averaged 82% to produce a wash ash averaging 8%. A plant would receive ROM coal with dilution and moisture at about 4% and wash it to a clean coal at about 8% ash and 8% moisture. It is projected to achieve a 70% as received yield. Product coal will be <0.5% S and phosphorus less than 0.01%P in coal. The ash chemistry is better than that of Sukunka and Quintette and probably better than Bullmoose. This means that Monkman will have CSR values in the 60+ range compared to Quintette 52-57 range. Stability index is estimated at 57 (good). Fluidity is 50-200 ddpm which is normal for Gates Formation coals and better than for most of the coals from SE BC. Total organic inerts are estimated to be 33%.

In general Monkman coal could be superior to any other NE BC coal based on higher rank and lower base/acid ratio than other Gates Formation coals. Generally coals with high ash fusion temperatures for

ash also have low base/acid ratios and will make coke with high CSR. In this context it is worth noting that Sukunka ash fusion temperatures are about 200'C lower than Monkman.

Development scenarios

Smokey River is developing underground mines on its own property and is under no pressure to develop new mines and may not want to bring on extra supply to compete with supply from the Smokey mine. It should be emphasized though that Monkman is a lower rank coal. Monkman could be mined as a surface operation, trucking raw coal to the Quintette plant. the plant is already set up to handle coal delivered by truck (for example coal from the Shikano pits). Equipment for the mining could be available from Bullmoose and Quintette if these operations are scaled back. Also if Smokey or other owners are not interested in proceeding with the development then Teck could manage the operation and switch personnel from Quintette to Monkman. There are possibilities for underground mining but dips are steeper than those of coal mined at Smokey River. Longwall and conventional room and pillar mining techniques would not work at dips greater than about 15'. it may be possible to underground mine down plunge in the core of the Duke Mountain syncline and surface mine on the limbs.

An operation at Monkman could start up with minimal capital. Some road improvement, pre stripping and installation of a loadout area with grizzly and bradford breaker to remove some rocks would be required.

In that industry has not shown any enthusiasm for Sukunka it may be possible for the government or BC Rail to act as a facilitator to bring together the parties involved in Monkman. A study/paper on the geology and mining costs of a scaled back Monkman project may be worth considering.

Summary

This note represents minimal research but it does appear that Monkman could be a better prospect for development than Sukunka in a situation where Quintette was scaled back but there was still economic to export coal from the NE. To proceed further there must be an expression of interest by Smokey and a more detailed evaluation of the geology and mining costs associated with a 1 million tonne/year operation.